

REMARKS

In the Office Action mailed October 28, 2005, Claims 2-4, 16, 18 and 20-22 have been objected to for using the article “a.” The claims have been amended to replace “a” by “the.” Withdrawal of the objection is respectfully requested.

The specification has been objected to as failing to provide proper antecedent basis for a closed reservoir. Claims 1 and 4 have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly unclear in the recitations “an outlet member mounted so as to close an opening in the liquid reservoir” and an “outlet port [that] comprises a protruding nozzle.” In the interest of expediting prosecution, Claim 1 has been amended, and Claim 4 has been cancelled without prejudice and rewritten as new Claims 24-29. New claims 30 and 31 have been added. Claim 1 now recites a cassette comprising a separate outlet member attached and adjacent to the liquid reservoir, wherein the outlet member provides an aperture that prevents the leakage of liquid and through which liquid drops in the range of 10-500 nanoliters can be forced by a pulse of pressurized gas. Support for this amendment may be found in the specification, for example, at page 1, lines 8-11, page 3, lines 17-29, page 4, lines 7-19, page 5, lines 33-37, page 7, lines 6-17 and Figure 2. Claim 3 has been amended to recite a single aperture. Support for the amendment of Claim 3 may be found in the specification, for example, at page 4, lines 30-31. Claim 24 recites a cassette comprising a separate protruding nozzle attached and adjacent to the liquid reservoir. Support for the subject matter of Claim 24 may be found in the specification, for example, at page 4, lines 4-6, page 5, lines 33-37, page 7, lines 6-17 and Figure 1. Support for the subject matter of Claims 25-29 may be found in original Claims 18 and 20-23. Support for the subject matter of Claims 30 and 31 may be found in the specification, for example, at page 4, lines 7-8 and page 11, line 36, page 12, line 1, respectively.

Claim 23 has been rejected under 35 U.S.C. § 112, second paragraph, as allegedly failing to further limit the structure of Claim 1. Claim 23 has been amended to add “a pressurized gas source.” Support for the amendment of Claim 23 may be found in the specification, for example, at page 8, line 24 - page 9, line 8.

In view of the foregoing comments and amendments, withdrawal of the objection to the specification and the rejection of Claims 1, 4 and 23 under 35 U.S.C. § 112, second paragraph, is respectfully requested.

Claims 1-4 and 23 have been rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 6,783,732 to Madden et al. ("Madden et al."). The Examiner has alleged that Madden et al. disclose a device comprising a plurality of reservoirs with outlets.

Applicants respectfully submit that Madden et al. fail to teach or suggest a cassette for dispensing liquid drops or a liquid dispensing apparatus as claimed herein. Rather, Madden et al. disclose a microfiltration apparatus comprising a well including a minicolumn and a drip detector, with a filter disposed between the lower portion of the minicolumn and the upper portion of the drip detector. The presently claimed liquid dispensing apparatus comprises a liquid reservoir to having an outlet member attached and adjacent thereto. The drip detector of Madden et al. is not an outlet member or protruding nozzle as claimed herein. Clearly, the drip detector of Madden et al. is not adjacent to a liquid reservoir, because it is adjacent to a filter. Madden et al. thus do not teach every element of the claims.

The Examiner has alternatively asserted that the filters of the references are equivalent to the claimed outlet member because it is well-known for filters to comprise pores. Office Action mailed October 28, 2005 at page 5. However, filters comprising pores do not prevent leakage of fluid, as do the outlet members claimed herein. Further, Claim 3 is directed to an outlet member comprising a single aperture, whereas filters comprising pores necessarily have a plurality of pores.

Further, Madden et al. do not teach an outlet member having an aperture through which liquid drops can be forced by a pulse of pressurized gas, claimed herein. The device of Madden et al. is configured to provide a flow of liquid (See, e.g., Col. 12, lines 62-65 and Col. 18, lines 41-43), and not discrete drops. One could not have been motivated to modify the device of Madden et al. to dispense drops, because such modification would prevent the microfiltration function of the device.

Accordingly, Madden et al. fail to teach every element of the presently claimed invention. Withdrawal of the rejection of Claims 1-4 and 23 under 35 U.S.C. § 102(e) in view of Madden et al. is respectfully requested.

Claims 1-4 and 23 have been rejected under 35 U.S.C. § 102(e) as allegedly anticipated by U.S. Patent No. 5,846,493 to Bankier et al. ("Bankier et al."). The Examiner has alleged that Bankier et al. disclose a filtering system comprising columns having a reservoir and a tapered nozzle with an opening protruding from one end.

Applicants respectfully submit that Bankier et al. fail to teach or suggest a cassette for dispensing liquid drops or a liquid dispensing apparatus as claimed herein. Rather, Bankier et al. disclose a filtration system having a plurality of columns for receiving solutions through an inlet end and dispensing the solutions through an outlet end. A filter is provided in each of the columns to capture a substance within the solution. In one embodiment, a conical tip leads to the outlet end of each of the columns.

The Examiner has alleged that the filter in each of the columns taught by Bankier et al. is equivalent to the outlet member of the cassette claimed herein. Applicants respectfully disagree. The filters taught by Bankier et al. do not prevent leakage of fluid, as claimed herein. Further, it is well-known that filters comprising pores have a plurality of pores, wherein the outlet members of the cassette of Claim 3 herein have a single aperture.

Further, the conical tip depicted in Figure 5 of Madden et al. is not a protruding nozzle. The cassette claimed herein in Claims 25-30 comprises a separate protruding nozzle attached and adjacent to the liquid reservoir. As disclosed in the present specification, for example, at page 3, lines 17-29, this feature is advantageous because it allows the liquid reservoir and the outlet member to be formed of different materials. In the device of Bankier et al., the conical tip is part of the column ("the interior wall of the column 10 begins a taper to a tip 42" Bankier et al. at Col. 5, lines 31-32), not separate and attached to the liquid reservoir.

Further, the filtration device of Bankier et al. does not have an aperture through which liquid drops can be forced by a pulse of pressurized gas, as claimed herein. Rather, the device of Bankier et al. is configured to provide a flow of liquid. The device of Bankier et al. is designed "for drawing a solution" (Col. 1, line 40); the plurality of columns "dispenses solution" (Col. 1,

line 51); a vacuum is provided to “draw the solution” (Col. 2, line 31). The claimed subject matter is thus not anticipated by Bankier et al. In addition, and as discussed further hereinbelow, one would not have been motivated to modify the device of Bankier et al. to dispense drops, because such a modification would result in a device that would perform differently than the device of Bankier et al. Accordingly, the differences between the claimed cassettes and the prior art devices are not matters of design choice and are not obvious. Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 U.S.P.Q. 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 U.S.P.Q. 232 (1984).

In view of the foregoing comments and amendments, withdrawal of the rejection of Claims 1-4 and 23 under 35 U.S.C. § 102(e) in view of Bankier et al. is respectfully requested.

Claims 1-4, 18 and 20-23 have been rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 5,035,866 to Wannlund (“Wannlund”). The Examiner has alleged that Wannlund discloses an apparatus having reaction wells including at least two reaction cups arranged one above the other, and that the uppermost reaction cups have orifices in the bottoms. The Examiner has further alleged that the upper cup has an orifice in the bottom that is closed by a removable plug.

With respect to Figure 5 of Wannlund, the Examiner has alleged that the series of stacked cups may be considered cartridges, the liquid reservoir may be considered the series cups, and the “upper cups close off access to the bottom cup constituting an equivalent to the outlet member recited in the claim.” Office Action mailed October 28, 2005 at page 4. The Examiner has further alleged that the intermediate cup is equivalent to the claimed nozzle.

Applicants respectfully submit that the apparatus of Wannlund does not comprise a separate outlet member attached to a liquid reservoir, wherein the outlet member provides an aperture through which liquid drops can be forced. Nor does Wannlund disclose an apparatus comprising a separate protruding nozzle attached to a liquid reservoir through which liquid drops can be forced.

Wannlund discloses an apparatus for performing sequential reactions on a biological sample such as urine. A urine sample is added to an upper cup that contains reagents. Upon completion of a reaction in the upper cup, a removable plug in an orifice of the upper cup is

ejected and the urine flows into the lower cup for a second reaction. Wannlund teaches that the orifice is disposed such that liquid flows through into the lower cup. Wannlund at Col. 3, lines 33-35; Col. 3, lines 47-52; Col. 6, lines 54-55; Col. 8, lines 48-50; Col. 9, lines 33-36; Col. 11, lines 12-17; Col. 14, lines 9-12. The apparatus of Wannlund does not include an aperture or nozzle of a size that prevents leakage of fluid and through which drops can be forced, and thus fails to anticipate the presently claimed invention. Withdrawal of the rejection of Claims 1-4, 18 and 20-23 under 35 U.S.C. § 102(b) in view of Wannlund.

Claim 16 has been rejected under 35 U.S.C. § 103(a) as allegedly rendered unpatentable by Madden et al., Wannlund or Bankier et al. The Examiner has alleged that the references do not recite an outlet port of the respective nozzles comprising an aperture having a diameter between 2 and 300 micrometers, but that it would have been obvious to modify the devices to have an opening in that range in order to precisely control the amount of fluid exiting each reservoir.

Applicants respectfully submit that for all of the reasons discussed herein above, none of the cited references teach a cassette having cartridges comprising a liquid reservoir and a separate outlet member attached adjacent to the liquid reservoir wherein the outlet member provides an aperture through which liquid drops can be forced by a pulse of pressurized gas. Further, there is no suggestion in the cited references to utilize an aperture having a width of between 2 and 300 micrometers and one of ordinary skill in the art would not have been motivated to make such a modification.

Madden et al. disclose an apparatus for filtration, and thus there would have been no motivation to “precisely control” the amount of fluid exiting each reservoir so as to dispense very small volumes of liquid. To the contrary, in a filtration application, the motivation is to discharge all of the fluid from the filtration well into the collection well, without regard for precise control of the amount of fluid existing the filtration well.

Similarly, Bankier et al. disclose an apparatus for filtration in which a solution is received through the inlet end of a column and dispensed through an outlet end without regard for precise control of the amount of solution dispensed from the column. In the filtration applications disclosed by Bankier et al. and Madden et al., there is simply no reason to precisely control the

amount of exiting fluid, and thus no motivation to modify the devices as the Examiner has suggested.

Further, both Madden et al. and Bankier et al. disclose vacuum filtration systems in which a vacuum is used to increase the flow of liquid through the filter relative to the flow produced by gravity. It would be contrary to the purpose of vacuum filtration as used in the cited references to modify the device to precisely control the amount of fluid, or to reduce the amount to single drops.

In utilizing the device of Wannlund, there is also no reason to precisely control the amount of fluid exiting from the upper reaction cup. The device of Wannlund is used for the detection of bacteria in a urine sample. The urine sample is added to reactants in the upper reaction cup to release and eliminate non-bacterial ATP in a reaction that requires about 10 to 60 minutes to complete. The treated urine in the upper cup is then released into the lower cup for a reaction in which bacterial ATP is released and reacted with light producing reagents. See Wannlund at Col. 4, lines 26-43. The upper reaction cup has an orifice closed by a removable plug. When the reaction in the upper cup is complete, the plug is ejected so that the urine flows into the lower cup for the second reaction. Thus the purpose of the orifice in the upper cup is to allow the first reaction to proceed to completion before the reaction in the lower cup is commenced. The sequential reactions are necessary to permit removal of non-bacterial ATP prior to the release of bacterial ATP for luminescent detection. There is no reason to precisely control the amount of liquid that flows from the upper reaction cup, and thus there would not have been motivation to modify the device of Wannlund to include an aperture having a width of between 2 and 300 micrometers. Further, the device of Wannlund is designed to provide quick results (Wannlund at Col. 7, lines 12-15), and so one would not be motivated to use an orifice that limits the flow of the sample. The light producing reaction in the lower cup is completed in no more than 30 seconds (Wannlund at Col. 14, lines 15-18), and so one would be motivated to have an orifice that allows quick flow into the lower cups. Wannlund thus teaches away from the present invention.

The Examiner has further alleged that it would have been an obvious matter of design choice to change the size of the aperture. In the present case, the size of the aperture is not a

matter of design choice, but rather contributes to a device that performs and operates differently than the devices of the prior art. The present device dispenses liquid drops, whereas the prior art devices for microfiltration and reaction tests necessarily dispense a flow of liquid. Accordingly, the subject matter of Claim 16 is not obvious. Gardner v. TEC Systems, Inc., 725 F.2d at 1349, U.S.P.Q. at 786 (obviousness determination affirmed because dimensional limitations in claims did not specify a device which performed and operated differently from the prior art).

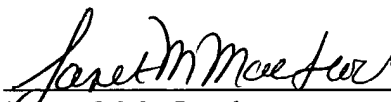
Withdrawal of the rejection of Claim 16 under 35 U.S.C. § 103(a) is respectfully requested.

In view of the foregoing comments and amendments, it is respectfully submitted that the present application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

DORSEY & WHITNEY LLP

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By:   
Janet M. MacLeod  
Reg. No.35,263  
250 Park Avenue  
New York, NY 10177  
(212) 415-9366